

**SUPPLEMENTAL
REPORT OF STUDY
OF
BOILER DESIGN IN REGARD
TO
INDECK KEYSTONE ENERGY
V.
VICTORY ENERGY OPERATIONS**

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The following analysis is based upon new documents that were not produced by Victory Energy Operations, LLC (“VEO”) until during and after the writer’s deposition on October 11, 2006.

I. Documents Studied:

Engineering drawings were studied. They consisted of:

- Copies of Engineering Drawings identified as Seibel’s Exhibit 3, which VEO represented to be a sample of its current “Voyager” boiler designs.

(It should be noted that two critical drawings, necessary to evaluate the Voyager boiler design in its entirety, were omitted from the engineering drawings that were included in Seibel’s Deposition Exhibit 3. They are a Tube Arrangement drawing, which is a horizontal cut through the boiler assembly that shows the number and location of tubes within the boiler, and a Refractory, Tile and Insulation drawing that locates and details required refractory and insulation construction and materials. The Voyager design may be identical or substantially similar to the Keystone® Boiler in additional respects that are not specifically identified in this or my initial report, but it is not possible to identify those additional items, based upon the information provided thus far by VEO.)

- Copies of Engineering Drawings from Erie Power Technologies, Inc. (“EPTI”), identified as the “marked-up” Heinz Project drawings, which have been Bates labeled VEO 3501 to VEO 3540 (the “Heinz Drawings”).

- Eight series of copies of Engineering Drawings, identified below, that were said to be representative of Keystone® Steam Generators that were fabricated by VEO based on information obtained from EPTI (Project information, as shown, was taken from data on the drawings.):

Project Name	Year of Project	VEO Project Number	Boiler Steaming Capacity, Pounds/hour	Document Identification, Bates, Numbers	
				Start	Finish
Trojan Energy, Roswell Park	2003	J-VE-251	50,000	VEO 5849	VEO 5971
Protherm Corp. Nestle Purina	2003	J-VE-254	60,000	VEO 5972	VEO 6060
Dallas Fort Worth Airport	2004	J-VE-262	83,300	VEO 5742	VEO 5848
Logan Aluminum	2004	J-VE-282	50,000	VEO 5608	VEO 5741
Oxyvinls - Deer Park	2003	J-VE-289	75,000	VEO 6425	VEO 6555
Ware Rental Boilers	2004	J-VE-301	75,000	VEO 6283	VEO 6369
Ware Rental Boilers	2004	J-VE-302	75,000	VEO 6370	VEO 6424
VEO Worcester Polytechnic	2005	J-VE-313	23,000	VEO 6143	VEO 6282

Notes: 1. The Trojan Energy-Roswell Park boiler does not have welded front and rear walls.

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(notes, cont'd.)

2. Furnace Wall Assembly drawings for project J-VE-302 were not included in the set studied.

II. Study of Information:

In this study, information and views of the Heinz Drawings were compared to information on the comparable drawings from Seibel's Deposition Exhibit 3 and to the drawings for the Keystone® Steam Generators that were fabricated by VEO. I understand from attending the deposition of VEO's expert witness, Paul Miller, that the information contained in Seibel's Exhibit 3 was made available to him by VEO before October 11, 2006, and that he also compared several of those same drawings of the respective boilers and boiler designs.

(A) Information Pertaining to the Boiler Front Wall Design:

Drawings used in the study of boiler front wall designs were:

Reference	Document Identification, Bates, Number or Drawing Number
Heinz "marked up" drawing	VEO 3522
Seibel's Deposition Exhibit 3	12-444-F
Trojan Energy, Roswell Park	Not Applicable
Protherm Corp. Nestle Purina	VEO 6086
Dallas Fort Worth Airport	VEO 5782
Logan Aluminum	VEO 5657
Oxyvinls - Deer Park	VEO 6481
Ware Rental Boilers	VEO 6322
Ware Rental Boilers	Not Produced
VEO Worcester Polytechnic	VEO 6167

It was found that the designs were identical or substantially similar, and information presented on the drawings was identical or substantially similar in many aspects, as follows:

- 2 inch OD tubes;
- Off-center bars welded between tubes;
- Four inch centerline spaces between tubes;
- Identical Tube bend radii;
- Straight edge bars welded on the outside face of the welded walls;

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Identical Drawing Notes with the same errors;
 Identical Membrane weld detail views;
 Identical arrangement of refractory stud design and views;
 Tubes nearest the front entering the drums one foot from the plane of the wall; and
 Identical tube and welded bar material

(B) Information Pertaining to the Boiler Rear Wall Design:

Drawings used in the study of boiler rear wall designs were:

Reference	Document Identification, Bates, Number or Drawing Number
Heinz "marked up" drawing	VEO 3523
Seibel's Deposition Exhibit 3	12-444-C
Trojan Energy, Roswell Park	Not Applicable
Protherm Corp. Nestle Purina	VEO 6088
Dallas Fort Worth Airport	VEO 5784
Logan Aluminum	VEO 5660
Oxyvinls - Deer Park	VEO 6484
Ware Rental Boilers	VEO 6326
Ware Rental Boilers	Not Produced
VEO Worcester Polytechnic	VEO 6167

It was found that the designs were identical or substantially similar, and information presented on the drawings was identical or substantially similar in many aspects, as follows:

2 inch OD tubes;
 Off-center bars welded between tubes;
 Four inch centerline spaces between tubes;
 Identical Tube bend radii;
 Straight edge bars welded on the outside face of the welded walls;
 Identical Drawing Notes with the same errors;
 Identical Membrane weld detail views;
 Identical arrangement of refractory stud design and views;
 Tubes nearest the front entering the drum entering the drums one foot from the plane of the wall;
 and

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Identical tube and welded bar material

(C) Information Pertaining to the Furnace and Outer Wall Design:

The furnace and outer wall designs cannot be compared because drawings for the assembly of those walls were not produced by VEO in the set of drawings identified as Seibel's Deposition Exhibit 3 or otherwise.

(D) Information Pertaining to Boiler Lifting Lugs:

Drawings used in the study of lifting lug designs were:

Reference	Document Identification, Bates, Number or Drawing Number
Heinz "marked up" drawing	VEO 3509
Seibel's Deposition Exhibit 3	12-444-01
Trojan Energy, Roswell Park	VEO 5941
Protherm Corp. Nestle Purina	VEO 6076
Dallas Fort Worth Airport	Not Applicable
Logan Aluminum	VEO 5639
Oxyvinls - Deer Park	VEO 6458
Ware Rental Boilers	VEO 6313
Ware Rental Boilers	VEO 6399
VEO Worcester Polytechnic	VEO 6025

It was found that all referenced drawings showing lifting lugs used to off-load and position the boilers for all referenced units reflect:

Identically or substantially similar shaped lifting lugs welded onto the upper drum at the junction between the drum head and shell at the front and rear of the drums;
Identical or substantially similar weld notes;
Identical or substantially similar Quality Control Specifications; and
Identical or substantially similar references to Quality Control in drum fabricator notes

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III. Findings:

VEO's incorporation into the Voyager boiler line of various features that are identical or substantially similar to the Keystone® Steam Generator can be traced from design and engineering information that EPTI provided to VEO, initially in connection with the Heinz Project, and subsequently during the term of the License Agreement.

It was specifically found that:

- (A) EPTI (successor to Erie City Iron Works, Zurn, and Aalborg Industries, and predecessor to IKE) licensed the production of certain Keystone® Steam Generators to VEO.

The "M" series Keystone® Steam Generator designs are highly standardized to reduce engineering involvement and cost. "M" series Keystones have been offered in the marketplace since 1965 and represent the evolution of a series of "O" type boilers that Erie City Iron Works had offered in the market since 1950. More than three thousand Keystone® Steam Generators have been designed, fabricated and operated, and most are still in operation today.

Along with the "M" series Keystone® Steam Generators, Erie City Iron Works and its successors developed and offered unique variations of the "M" series Keystone® designs called "nonstandard" designs to meet customer specifications calling for features that increased "water cooled" surfaces in the boiler "setting," higher steam purity, higher steam pressures, and superheaters.

Prior to and during the term of that License Agreement, EPTI transmitted design and engineering information to VEO about both the standard "M" series Keystone® Steam Generators, as well as the unique variations associated with the nonstandard Keystone® Steam Generators.

- (B) Some of the information that EPTI provided to VEO about Keystone® Steam Generator engineering and designs was provided in electronic form. That apparently facilitated VEO's ability to copy and manipulate design information into its own drawings and designs for the Voyage boiler series using computer software and hardware. Regardless of whether information was provided electronically or in paper form, the drawings and design information about the Keystone® Steam Generators that EPTI provided to VEO contained some restrictive legend or other identification as the property of EPTI, and was not readily known or accessible by the public.
- (C) In connection with the License Agreement, EPTI also provided VEO with a closely held, confidential manual of information about the background of Keystone® Boiler design. Furthermore, to assist with marketing and production of the licensed Keystone® Steam Generators, EPTI allowed VEO to use a computer-based design program, on a limited, very restricted basis. That computer design program had been developed in-house, solely by EPTI.

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With the confidential design manual, VEO was able to find and identify important design factors that were developed by EPTI and its predecessors through testing and observation of the thousands of Keystone® Steam Generators that have been designed, built and operated.

VEO used information that it obtained to develop a line of “O” type boilers that are substantially similar in physical dimensions, and communicated data to an engineering design contractor. That contractor was to develop a computer program to predict performance of a particular size boiler under specified operating conditions of operating pressure and with a specified fuel. In connection with that effort, VEO informed the contractor of a critical design allowance, taken from EPTI information (all of which is now owned by IKE). Such disclosure is evidence that VEO copied and relied upon information that had been disclosed to it by EPTI in confidence.

- (D) In the course of manipulating the electronic data that EPTI had provided to it, VEO was able to convert the Keystone® Steam Generator drawings and engineering information to its own format, and replacement “Title block” identifications allowed VEO to bypass notices that the information being used was owned by IKE and its predecessors, thereby concealing or obscuring the fact that VEO had copied such materials directly from their original source, i.e., EPTI.
- (E) Several concerns arise from the study of the Voyager boiler design, as set forth in the materials that VEO produced on October 11, 2006.

The Keystone® Steam Generator thermal performance, steam and water circulation, structural designs have evolved over more than 50 years since the product was first introduced into the boiler market. Over that time, thousands of man hours of design and manufacturing engineering study have been expended to improve the Keystone® Steam Generator. Evolution of the design has been driven by insuring safety, continual study of cost-effectiveness, finding ways to improve performance and developing designs which reduce maintenance and increase service life.

Adherence and compliance with the American Society of Mechanical Engineers (ASME) Boiler Code required Quality Control checks and limits. Optimum manufacturing processes, such as fabrication sequences for the thousands of pieces needed for a boiler, and welding processes were developed by IKE’s predecessors through experience with Keystone® Steam Generator operation and by Engineering studies.

Much of the critical engineering design, fabrication procedures and quality control aspects have not been released outside of IKE or its predecessors, except where the required information must be transmitted to material suppliers and fabricators. In these cases the information is specifically protected.

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Keystone® Steam Generators, both the standard “M” series and the “nonstandard,” are integrated designs. By copying some of the Keystone® Steam Generator designs and integrating them, in part or in whole, VEO would seem to have saved substantial engineering and design costs, and greatly reduced its risk and time to introduce a “new” Package Boiler Product to the market. Also, by what it has done, VEO may represent its design as one that is based on experienced, proven designs.

However, the Voyager boiler also appears to contain some design features that are not identical or substantially similar to the Keystone® Steam Generator. Thus, there must be concern where only part of a proven design is used. If the complete design is not followed, not only should there be concern about performance, but also and, more important, there must be concern about near term and long term aspects of safety. Thus, there is an increased likelihood that the dissimilar design features that VEO has attempted to incorporate into the Voyager boiler line could fail. If and when that occurs, there is also an increased likelihood that VEO will replace those failed designs with the features currently integrated into the original Keystone® Steam Generator design – of which VEO had possession and currently retains knowledge, but which are owned exclusively by IKE.

A handwritten signature in black ink, appearing to read "Robert V. Seibel". The signature is written in a cursive, flowing style.